



Be persuasive. Be brave. Be arrested (if necessary)

A resource crisis exacerbated by global warming is looming, argues financier **Jeremy Grantham**. More scientists must speak out.

I have yet to meet a climate scientist who does not believe that global warming is a worse problem than they thought a few years ago. The seriousness of this change is not appreciated by politicians and the public. The scientific world carefully measures the speed with which we approach the cliff and will, no doubt, carefully measure our rate of fall. But it is not doing enough to stop it. I am a specialist in investment bubbles, not climate science. But the effects of climate change can only exacerbate the ecological trouble I see reflected in the financial markets — soaring commodity prices and impending shortages.

My firm warned of vastly inflated Japanese equities in 1989 — the grandmother of all bubbles — US growth stocks in 2000 and everything risky in late 2007. The usual mix of investor wishful thinking and dangerous and cynical encouragement from industrial vested interests made these bubbles possible. Prices of global raw materials are now rising fast. This does not constitute a bubble, however, but is a genuine paradigm shift, perhaps the most important economic change since the Industrial Revolution. Simply, we are running out.

The price index of 33 important commodities declined by 70% over the 100 years up to 2002 — an enormous help to industrialized countries in getting rich. Only one commodity, oil, had been flat until 1972 and then, with the advent of the Organization of the Petroleum Exporting Countries, it began to rise. But since 2002, prices of almost all the other commodities, plus oil, tripled in six years; all without a world war and without much comment. Even if prices fell tomorrow by 20% they would still on average have doubled in 10 years, the equivalent of a 7% annual rise.

This price surge is a response to global population growth and the explosion of capital spending in China. Especially dangerous to social stability and human well-being are food prices and food costs. Growth in the productivity of grains has fallen to 1.2% a year, which is exactly equal to the global population growth rate. There is now no safety margin.

Then there is the impending shortage of two fertilizers: phosphorus (phosphate) and potassium (potash). These two elements cannot be made, cannot be substituted, are necessary to grow all life forms, and are mined and depleted. It's a scary set of statements. Former Soviet states and Canada have more than 70% of the potash. Morocco has 85% of all high-grade phosphates. It is the most important quasi-monopoly in economic history.

What happens when these fertilizers run out is a question I can't get satisfactorily answered and, believe me, I have tried. There seems to be only one conclusion: their use must be drastically reduced in the next 20–40 years or we will begin to starve.

The world's blind spot when it comes to the

fertilizer problem is seen also in the shocking lack of awareness on the part of governments and the public of the increasing damage to agriculture by climate change; for example, runs of extreme weather that have slashed grain harvests in the past few years. Recognition of the facts is delayed by the frankly brilliant propaganda and obfuscation delivered by energy interests that virtually own the US Congress. (It is not unlike the part played by the financial industry when investment bubbles start to form ... but that, at least, is only money.) We need oil producers to leave 80% of proven reserves untapped to achieve a stable climate. As a former oil analyst, I can easily calculate oil companies' enthusiasm to leave 80% of their value in the ground — absolutely nil.

The damaging effects of climate change are accelerating. James Hansen of NASA has screamed warnings for 30 years. Although at first he was dismissed as a madman, almost all his early predictions, disturbingly, have proved conservative in relation to what has actually happened. In 2011, Hansen was arrested in Washington DC, alongside Gus Speth, the retired dean of Yale University's environmental school; Bill McKibben, one of the earliest and most passionate environmentalists to warn about global warming; and my daughter-in-law, all for protesting over a pipeline planned to carry Canadian bitumen to refineries in the United States, bitumen so thick it needs masses of water even to move it. From his seat in jail, Speth said that he had held some important positions in Washington, but none more important than this one.

President Barack Obama missed the chance of a lifetime to get a climate bill passed, and his great environmental and energy scientists John Holdren and Steven Chu went missing in action. Scientists are understandably protective of the dignity of science and are horrified by publicity and overstatement. These fears, unfortunately, are not shared by their opponents, which makes for a rather painful one-sided battle. Overstatement may generally be dangerous in science (it certainly is for careers) but for climate change, uniquely, understatement is even riskier and therefore, arguably, unethical.

It is crucial that scientists take more career risks and sound a more realistic, more desperate, note on the global-warming problem. Younger scientists are obsessed by thoughts of tenure, so it is probably up to older, senior and retired scientists to do the heavy lifting. Be arrested if necessary. This is not only the crisis of your lives — it is also the crisis of our species' existence. I implore you to be brave. ■

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